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THE VALUE OF CORN OIL AS A SUBSTITUTE FOR OLIVE OIL AND COTTONSEED OIL.

By B. E. POOL and L. E. SAYRE.

CORN OIL may be considered as a by-product from cereal manufacturing, and is made principally by the Corn Products Refining Company of New York. It is comparatively cheap, being quoted at 50 cents per gallon for the refined grade. Olive oil and cottonseed oil are quoted at \$3 and 75 cents per gallon, respectively.

The cheapness of corn oil suggests the possibility of wise economy in substituting it in place of the more expensive oils wherever this can be done without injury to the product in which it may be employed. The investigation of this subject embraces the following:

First, a comparison of the chemical behavior of the corn oil with those of the other more expensive oils mentioned. Second, a comparison of the products resulting from the substitution of corn oil for the other oils, in cases where the other oils are prescribed, in such preparations, for example, as ointments, liniments, plasters, etc., where the nature of the oil does not have any physiological or therapeutical significance.

In the examination and comparison of corn oil with other oils the following data have been sought:

- I. Physical properties.
- II. Saponification number.
- III. Iodine absorption number.

Corn oil has a pale yellow to a golden yellow color, a slight characteristic odor, a pleasant taste, very similar to that of freshly ground corn meal. The solubility in various solvents, as absolute alcohol, acetone, and glacial acid, is as follows:

Solubility at 15° C. in 100 parts by volume.

Absolute alcohol	3
Acetone	26
Glacial acetic acid	3

This compared to cottonseed oil and olive oil is as follows:

	Cottonseed oil.	Olive oil
Absolute alcohol	2	2
Acetone	27	24
Glacial acetic acid	4	3

The congealing point, composition and refractive index of the three oils may be seen from the subjoined table:

	Corn oil.	Cottonseed.	Olive.
Congealing point	—10 to 15° C.	—0 to —5° C.	—0 to —5° C.
Composition:			
Solid fatty acid*	27%	32%	15%
Liquid fatty acid†	73%	68%	85%
Refractive index by			
Strohmert at 15.5° C.	1.4768	1.4743	1.4698

In order to test and compare the corn oil with the other oils mentioned, a large number of medical preparations were made up, substituting this oil for the other oils prescribed by the United States Pharmacopœia and National Formulary. The various classes of preparations experimented with were as follows:

Liniments—Ointments—Cerates.
Plasters—Oleates.

In most every case where the corn oil was substituted for either olive or cottonseed oil as prescribed in the formula, a product was made which was equal in most if not every particular.

This being the case the question is pertinent, Would it not be a matter of economy to use corn oil in many preparations where a nondrying oil is used for other than medicinal preparations; for example, food preparations? Suggestions along this line of substitution are worthy of further study.

In conclusion, we would summarize our observations as follows:

In the assay of corn oil it was found to have properties very similar to the cottonseed and olive oil and, by comparison, it is found to be very similar in appearance. After testing it by direct substitution in the various medicinal preparations in which the other oils are used, and finding so very little change, it would seem not only to be a good recommendation to make that corn oil be recognized by the U. S. P. and N. F. for certain medicinal preparations, but it would also serve as a means of economy, bringing into use this cheap and valuable oil for which there is, at present, very little or comparatively no market.

* Solid fatty acid, in all cases, was composed of Palmetic and Stearic.

† Liquid fatty acid, in all cases, was found to be Linoleic and Oleic.